



Forest Insect & Disease Management

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EVALUATION SURVEY OF SOUTHERN PINE BEETLE INFESTATIONS ON THE OCONEE NATIONAL FOREST, GEORGIA

By

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ABSTRACT

Southern pine beetle (*Dendroctonus frontalis*, Zimm.) activity is increasing on the Oconee National Forest. Forty of the 232 aerially-detected spots were ground checked and all of these were confirmed to be southern pine beetle infestations. All southern pine beetle spots examined contained currently-infested trees, and a large number of these were green. A control project should be initiated on the Forest.

INTRODUCTION

The southern pine beetle is a forest pest that attacks all species of southern yellow pines. The species of pine most susceptible to attack on the Oconee are loblolly (*Pinus taeda*) and shortleaf pine (*P. echinata*). Overwintering occurs in all life stages but the later instars are favored since they move into the outer bark which provides insulation against low winter temperatures. Adults emerge in the spring and either vacate the spot in search of susceptible trees and begin new spots, or will attack adjacent trees and continue to enlarge the existing spot.

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The southern pine beetle has from five to seven generations per year depending on climate. If conditions are favorable, there is a great potential for rapid population buildup and widespread host mortality.

Outbreaks appear at periodic intervals and are first initiated in stressed stands. Stands where there is a high basal area are particularly susceptible. Water deficit caused by drought, overstocking and/or root diseases such as *Fomes annosus* adds to a stands susceptibility. The Oconee National Forest had all these problems last year.

In the past 15 years the Oconee has experienced three epidemic populations. The first reported outbreak peaked in 1963 and collapsed the following winter (Cambre and Padgett, 1964). In 1968, activity increased again but subsided (Barry, et al., 1968). Three years later in 1971, high levels of southern pine beetle were detected (Barry, et al., 1971). This epidemic lasted until 1974 (Barber, 1975).

SURVEY METHODS

In June 1979, the Aerial Survey Team (Carothers, 1979) did a 100 percent aerial photographic survey of the Oconee National Forest. The survey detected 232 areas of dead or dying pine (Table 1). The survey also showed that the southern pine beetle outbreak was distributed evenly over the southern portion of the District, the Hitchiti Experimental Forest, and Piedmont National Wildlife Refuge (Figure 1). Infestations are also present on the northern portion of the District, however, not as intensively as on the southern portion. From June 1-15, the Asheville Field Office, in cooperation with the Doraville Field Office, ground checked 40 of these spots (Table 2). Spot selections were made proportionate to their distribution and concentration on the forest.

Later, ground survey data were projected to reflect conditions on all aerially-detected spots.

RESULTS

All of the sampled southern pine beetle spots contained currently-infested trees. Although 45 percent of sampled trees were in the 2-25 tree size class, the majority were in excess of 25 trees (Table 2). Most notable was the large proportion of currently infested green trees, usually indicative of rapid beetle reproduction.

Table 1. Aerial Survey Data - Showing Number of Southern Pine Beetle Infestations Detected on the Oconee National Forest, Georgia

June 1979

Spot Size Class By No. of Active Trees	Number of Spots By Stand Class			Totals ^{2/}
	Pulpwood ^{1/}	Mixed ^{1/}	Sawtimber ^{1/}	
2-25	24	81	0	105
26-50	21	44	0	65
51-100	10	31	0	41
100	0	21	0	21
TOTALS	55	177	0	232

Table 2. Ground Check Data - Showing Number of Southern Pine Beetle Infestations By Size Class, Examined During the Ground Phase of the Evaluation on the Oconee National Forest, Georgia

June 1979

Spot Size Class By No. of Active Trees	Number of Spots By Stand Class			Totals
	Pulpwood	Mixed	Sawtimber	
2-25	4	14	0	18
26-50	4	7	0	11
51-100	2	5	0	7
100	0	4	0	4
TOTALS	10	30	0	40

^{1/}Projected from ground check data
^{2/}Actual from aerial photos

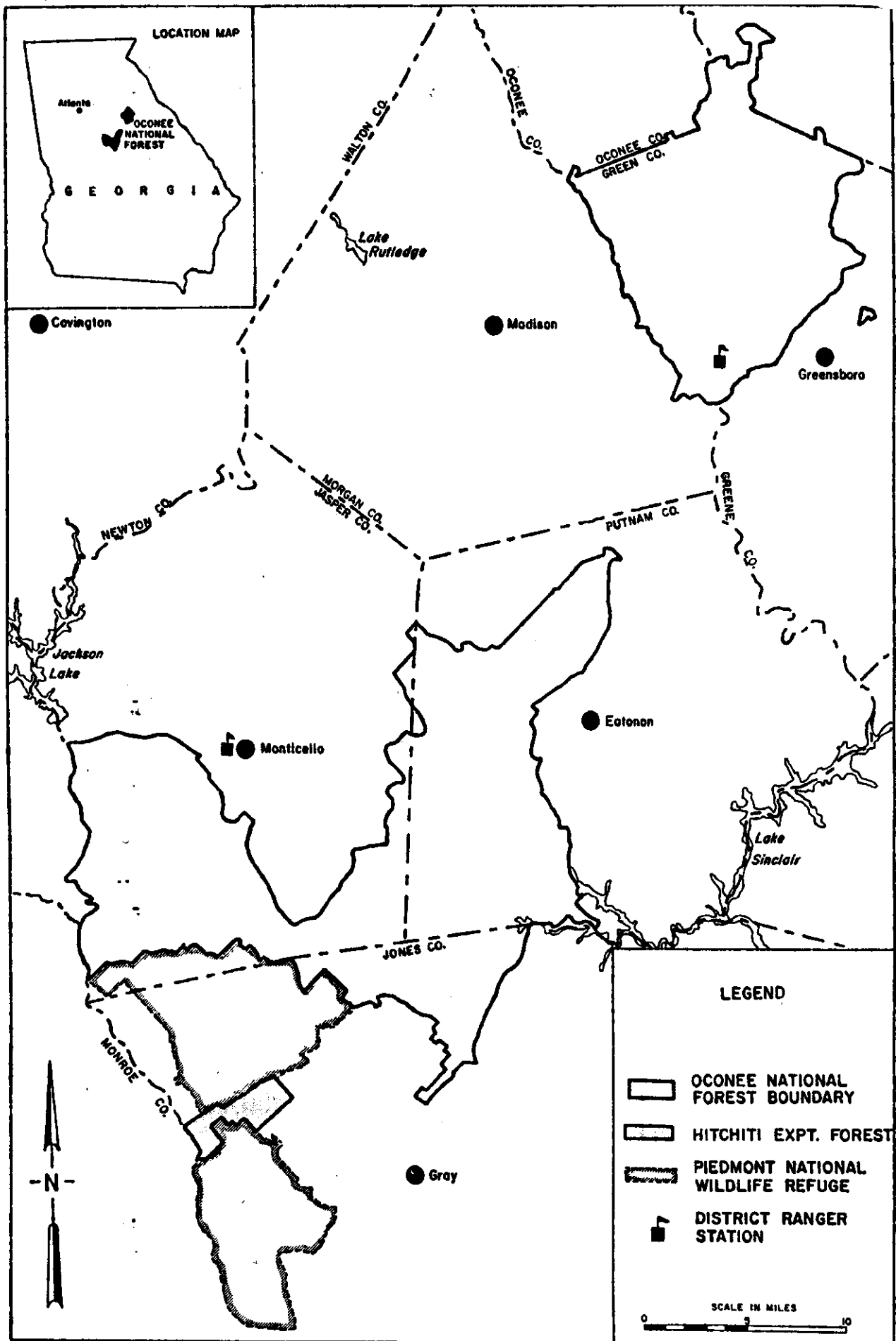


Figure 1: Location of the Oconee National Forest, Hitchiti Experimental Forest and Piedmont National Wildlife Refuge.

RECOMMENDATIONS

1. A control project should be begun to reduce southern pine beetle populations. Depending on individual spot situations, any one of three methods may be used:

- a. Removal of Infested Trees by Commercial Sale or Administrative Use. When infested trees of merchantable size are accessible, they should be removed by commercial sale or administrative use procedures. Logging of the infested material should begin immediately. Contract time limits should insure rapid removal.

When practical, and if host type is present, a 40- to 70-foot buffer strip should be marked and cut adjacent to and ahead of the most recently infested trees. This practice is effective in reducing the possibility of "breakouts." When only a small volume of infested merchantable material occurs in a spot, non-infested trees surrounding the spot may be marked to provide an operable cut.

The order of priority for removing beetle infested timber from a spot should be as follows:

Trees having nearly developed broods (usually the red and fading trees).

Trees having young broods (usually the green, recently infested trees).

Trees in the buffer zone.

- b. Piling and Burning. Unmerchantable or inaccessible southern pine beetle infestations can be suppressed by cutting, piling, and thoroughly burning the bark of infested trees. The entire bark surface must be thoroughly burned to insure effective control. The order of priority for cutting, piling, and burning infested trees, particularly the large spots, is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the piling and burning operation.
- c. Chemical Control. Chemical formulation recommended for southern pine beetle control is a 1/2 percent lindane spray with No. 2 fuel oil as the carrier. This may be formulated from a 20 percent lindane emulsifiable concentrate or oil concentrate at the rate of 11 pints of concentrate in enough fuel oil to make 55 gallons of spray. (Ratio of one part 20 percent lindane EC to 39 parts No. 2 diesel fuel.)

Cut, limb, and buck all infested trees into workable lengths. Spray the infested bark surface to the point of runoff. A compressed air sprayer (3-gallon capacity or equivalent) is an ideal applicator. Infested logs must be turned two or three times to insure complete treatment of infested bark. Spray stumps and bark removed by woodpeckers. Low pressure sprayers may be used to treat large accessible infestations.

The order of priority for cutting and spraying infested trees in large spots is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the chemical control operation.

Never spray trees from which southern pine beetle brood has emerged. Natural enemies of the southern pine beetle in these trees can then complete their development. To prevent aerial spotters from mapping treated spots, cut trees with red needles from which beetles have emerged.

Instructions for minimizing the adverse effects of mixing, transporting and storing pesticides, applying pesticides and disposing of pesticide containers and excess chemicals are outlined in Section 8.3 of the Forest Service Health and Safety Code FSM 5242.21.

- d. Reexamination of Treated Areas. Reexamine areas where infested trees were removed by commercial sales, piled and burned, or chemically treated within 2 or 3 weeks after treatment to check for additional infested trees. If additional trees are found, treat them.
2. In any area where infested trees are cut for chemical control or piling and burning or removed through commercial sales and administrative use procedures, stumps should be treated to control or prevent the root rot *Fomes annosus*.

Stands that have been previously thinned or have had a history of *F. annosus* infection, stumps should be treated with the competing fungus, *Peniophora gigantea*.

Stands that have no history of *F. annosus* and have never been thinned, the stumps should be treated with borax.

Southern pine beetle infested tree stumps cut during the period of May through August, and below the 34° N latitude do not have to be treated with either of the above materials. This is because few spores are formed during this period and high temperatures often kill spores that are produced. However, routine summer thinning in areas of southern pine beetle buildup is not recommended (Froelich, R. C., et al., 1977).

3. All forest personnel should be informed of the problem and instructed to maintain constant surveillance for southern pine beetle activity. All sightings should be reported to the control project foreman.
4. The Aerial Survey Team and Asheville Field Office should reevaluate this area in the fall of 1979.

PRECAUTIONARY PESTICIDE USE STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key -- out of the reach of children and animals -- away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Department of Agriculture, consult your county agricultural agent or State Extension specialist to be sure the intended use is still registered.

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